

PORTS

09/830810

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Gene name: O1-180

cDNA sequence: 1276 bp

“AAGGCGGGCGAGGCGGGACGCACCCATGTTCCCGGCGAG  
CACGTTCCACCCCTGCCCGCATCCTTATCCGCAGGCCACCAAAGCCGGGGATG  
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GGCTACAGACAGCTCATGGCCGCGGAGTACGTGACAGCCACCAGCGGGCAC  
AGCTCATGGCCCTGCTGTGCGGGATGGGTCCCCGGTCGGTCAGCAGCCGTGA  
CGCTGCGGTGCAGGTGAACCCGCGCCGCGACGCCTCGGTGCAGTGTTCACCTC  
GGGCGCCGCACGCTGCAGCCTGCAGGGTGCCGAGCCAGCCCCGACGCCCCGAT  
CGGGTTCCTGTCAACCCCGTGGCCACGCCGGCGCCGGGAGATCCCCGCGATC  
CTGGCAGACCGTAGCCCCGTTCTCGTCCGTGACCTTCTGTGGCCTCTCCTCCTC  
ACTGGAGGTTGCGGGAGGCAGGCAGACACCCACGAAGGGAGAGGGGAGCCC  
GGCATCCTCGGGGACCCGGGAACCGGAGCCGAGAGAGGTGGCCGCGAGGAA  
AGCGGTCCCCCAGCCGCGAAGCGAGGAGGGCGATGTTCAAGGCTGCAGGGCA  
GGCCGGGTGGGAGCAGCAGCCACCACCGGAGGACCGGAACAGTGTGGCGGC  
GATGCAGTCTGAGCCTGGGAGCGAGGAGCCATGTCCTGCCGCAGAGATGGCT  
CAGGACCCCGGTGATTTCGGATGCCCTCGAGACCAGGCCTCCCCGCAAAGCAC  
GGAGCAGGACAAGGAGCGCCTGCGTTTCCAGTTCTTAGAGCAGAAGTACGGCT  
ACTATCACTGCAAGGACTGCAAAATCCGGTGGGAGAGCGCCTATGTGTGGTGT  
GTGCAGGGCACCAGTAAGGTGTTACTTCAAACAGTTCTGCCGAGTGTGTGAGAA  
ATCCTACAACCCTTACAGAGTGGAGGACATCACCTGTCAAAGTTGTAAAAGAAC  
TAGATGTGCCTGCCCAGTCAGATTTGCCACGTGGACCCTAAACGCCCCCATC  
GGCAAGACTTGTGTGGGAGATGCAAGGACAAACGCCTGTCCTGCGACAGCAC  
CTTCAGCTTCAAATACATCATTTAGTGAGAGTCGAAAACGTTTCTGCTAGATGG  
GGCTAATGGAATGGACAAGTGAGCTTTCTCCCTCTTCACCTCTTCCCTTTCAA  
ATTCTTCATGACAGACAGTGTTACTTGGATATAAAGCCTGTGAATAAAAGGTAT  
TGCAAACAAAAAAAAAAAAAAAAAAAA”

Figure 1

**Amino Acid sequence: 361aa**

"MFPASTFHPCPHYPQATKAGDGWRFGARGCRPAPPSFLPGYRQLMAAEYVDS  
HQRALMALLSRMGPRSVSSRDAAVQVNPRRDASVQCSLGRRTLQPAGCRASPD  
RSGSCQPRGHAGAGRSRWSQTVAPFSSVTFCGLSSSLEVAGGRQTPTKGE  
SSGTREPEPREVAARKAVPQPRSEEGDVQAAGQAGWEQQPPPEDRNSVAAMQ  
GSEEPCPAAEMAQDPGDSAPRDQASPOSTEQDKERLRFQFLEQKYGYHCKD  
IRWESAYVWCVQGTSKVYFKQFCRVCEKSYNPYRVEDITCQSKRTRCACPV  
RFRHVDPKRPHRQDLCGRCKDKRLSCDSTFSFKYII"

Figure 2

**01-184 cDNA sequence: 1817bp**

GTCACAGCTTTCCCTGCCCGAATATGGTGATCTGTCTCCATTGTCCAGATCA  
GGATGATTCTTTAGAAGAAGTCACAGAGGAATGCTATTCCCCACCCACCCTC  
CAGAACCTGGCAATTCAGAGTCTACTGAGGGATGAGGCCCTTGGCCATTTCTG  
CTCTACGGACCTGCCCCAGAGTCTGTTCCCAGTAATTTTTGAGGAGGCCTTC  
ACTGATGGATATATAGGGATCTTGAAGGCCATGATACCTGTGTGGCCCTTCCC  
ATACCTTTCTTTAGGAAAGCAGATAAATAATTGCAACCTGGAGACTTTGAAG  
GCTATGCTTGAGGGACTAGATATACTGCTTGCAAAAAGGTTCAAACCAGTA  
GGTGCAAACTCAGAGTAATTAATTGGAGAGAAGATGACTTGAAGATATGGGC  
TGGATCCCATGAAGGTGAAGGCTTACCAGATTTTCAGGACAGAGAAGCAGCCA  
ATTGAGAACAGTGCTGGCTGTGAGGTGAAGAAAGAATTGAAGGTGACGACT  
GAAGTCCTTCGCATGAAGGGCAGACTTGATGAATCTACCACATACTTGTTGC  
AGTGGGCCCAGCAGAGAAAAGATTCTATTCATCTATTCTGTAGAAAGCTACT  
AATTGAAGGCTTAACCAAAGCCTCAGTGATAGAAATCTTCAAAACTGTACAC  
GCAGACTGTATACAGGAGCTTATCCTAAGATGTATCTGCATAGAAGAGTTGG  
CTTTTCTTAATCCCTACCTGAAACTGATGAAAAGTCTTTTCACACTCACACTA  
GATCACATCATAGGTACCTTCAGTTTGGGTGATTCTGAAAAGCTTGATGAGG  
AGACAATATTCAGCTTGATTTCTCAACTTCCCACACTCCACTGTCTCCAGAAA  
CTCTATGTAAATGATGTCCCTTTTATAAAAAGGCCAACCTGAAAGAATACCTCAG  
GTGCCTGAAAAAGCCCTTGGAGACACTTTGCATCAGTAACTGTGACCTCTCAC  
AGTCAGACTTGGATTGCCTGCCCTATTGCCTGAATATTTGTGAACTCAAACAT  
CTGCATATTAGTGATATATATTTATGTGATTTACTCCTTGAGCCTCTTGGTTTT  
CTCCTTGAGAGAGTTGGAGATACCCTGAAAACCCTGGAATTGGATTCATGTT  
GTATAGTGGACTTTCAGTTCAGTGCCTTGCTGCCTGCCCTAAGCCAATGTTCT  
CACCTCAGAGAGGTCACCTTCTATGATAATGATGTTTCTCTGCCTTTCTTGAA  
AACAACTTCTACACCACACAGCCCTGCTGAGTCAGCTGATCTATGAGTGTTAC  
CCTGCCCCCTCTAGAGTGCTATGATGACAGTGGTGTAATACTAACACACAGATT  
AGAAAGTTTTTGTCTGAGCTTCTGGATATACTGAGAGCCAAAAGACAGCTC  
CATAGTGTCTCCTTTCAAACAACCAAATGCTCTAAATGTGGTGGGTGCTACAT  
TTATGATCGGCATACCCAATGTTGCCGTTTTGTGGAACTACTATAAGCTTGAT  
TGTGAAACTGAGAAATAGAACTTAGTATTGGGGACTGATGAAATCCTAAGT  
GAATGTCCACTGCTAAATGGAGCATGAAAATGTCAATCACCTAAAAGTCTGA  
GATACACAGGAAAGTCAATAACTTCCTCTGAGCTGGTGAATGGATGTTGCAT  
CTGTAGAAAGTATCAAGCACTTGTAGTTTGAATGTGTTACAATAGAAGCACC  
ATTTTATGAGACTGGCCCAATCTGTTGACTGCATACAATAAATCTGTTGACTT  
ATTAAATTTTTAAAAAAAAAAAAAAAAAAAAAAAAAAAA

Figure 3

**O1-184 amino acid sequence: 426 amino acids**

MVICLHCPDQDDSL EEVTEECYSPPTLQNLAIQSLLRDEALAI SALTDL PQSLFP  
VIFEEAFTDGYIGILKAMIPVWPFPYLSLGKQINNCNLET LKAMLEGLDILLA QKV  
QTSRCKLRVINWREDD LKIWAGSHEGEGLPDFRTEKQPIENSAGCEVKKELKV  
TTEVLRMKGR LDESTTYLLQWAQQRKDSIHLFCRKLLIEGLTKASVIEIFKTVHA  
DCIQELILRCICIEEL AFLNPYLKLMKSLFTLTLDHII GTFSLGDSEKLDEETIFSLIS  
QLPTLHCLQKLYVNDV PFIKGNLKEYLRCLKKPLETLCISNCDLSQSDLDCLPYC  
LNICELKHLHISDIYLC D L L L E P L G F L L E R V G D T L K T L E L D S C C I V D F Q F S A L L P A L  
SQC S H L R E V T F Y D N D V S L P F L K T T S T P H S P A E S A D L

Figure 4

Gene name: O1-236

cDNA sequence: 1019bp

"GCCATATTGAGGACCTGCAGTAGAGGTGGAACCCATGACTGGCAGCGCAAAC  
ACAGTGATAACAGCTGAGCTCCAAGCAAGGACCCAGGACCTTGCCTCACCACA  
GACATAATCTTTCCCCACAACACCTCCACCAAGCCGCCCTGTAAATCGACATGA  
GTCGCCACAGCACCAGCAGCGTGACCGAAACCACAGCAAAAAACATGCTCTGG  
GGTAGTGAACCTCAATCAGGAAAAGCAGACTTGACCTTTAGAGGCCAAGGCGA  
GAAGAAGGACAGCTGTAACTCTTGCTCAGCACGATCTGCCTGGGGGAGAAAG  
CCAAAGAGGAGGTGAACCGTGTGGAAGTCCTCTCCCAGGAAGGCAGAAAACC  
ACCAATCACTATTGCTACGCTGAAGGCATCAGTCCTGCCCATGGTCACTGTGTC  
AGGTATAGAGCTTTCTCCTCCAGTAACTTTTCGGCTCAGGACTGGCTCAGGACC  
TGTGTTCTCAGTGGCCTGGAATGTTATGAGACTTCGGACCTGACCTGGGAAG  
ATGACGAGGAAGAGGAGGAAGAGGAGGAGGAAGAGGATGAAGATGAGGATG  
CAGATATATCGCTAGAGGAGATACCTGTCAAACAAGTCAAAAGGGTGGCTCCC  
CAGAAGCAGATGAGCATAGCAAAGAAAAAGAAGGTGGAAAAAGAAGAGGATG  
AAACAGTAGTGAGGCCCAGCCCTCAGGACAAGAGTCCCTGGAAGAAGGAGAA  
ATCTACACCCAGAGCAAAGAAGCCAGTGACCAAGAAATGACCTCATCTTAGCAT  
CTTCTGCGTCCAAGGCAGGATGTCCAGCAGCTGTGTTTTGGTGCAGGTGTCCA  
GCCCCACCACCCTAGTCTGAATGTAATAAGGTGGTGTGGCTGTAACCCTGTAAC  
CCAGCCCTCCAGTTTCCGGAGGTTTTTGGTGAAGAGCCCCCAGCAAGTTCGCC  
TAGGGCCACAATAAAATTTGCATGATCAGGAAAAAAAAAAAAAAAAAAAAA  
AAAAAAAAAAAA"

Figure 5

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**Amino Acid sequence: 207aa**

“MSRHSTSSVTETTAKNMLWGSELNQEKQTCTFRGQGEKKDSCKLLLSTICLGEK  
AKEEVNRVEVLSQEGRKPPITIALKASVLPMTVSGIELSPVTFRLRTGSGPVFLS  
GLECYETSDLTWEDDEEEEEEEEEDEDEDADISLEEIPVKQVKRVAPQKQMSIAKK  
KKVEKEEDETDDRPS PQDKSPWKKEKSTPRAKKPVTKK”

Figure 6

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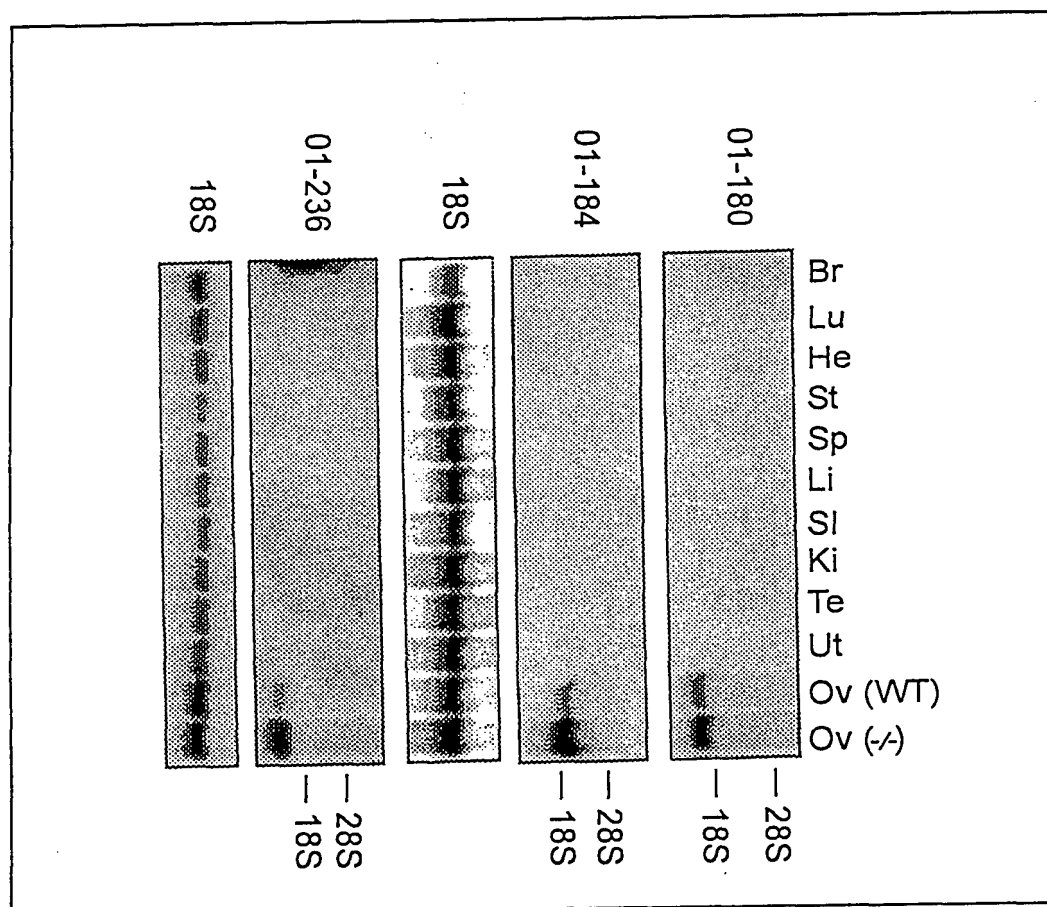


Figure 7

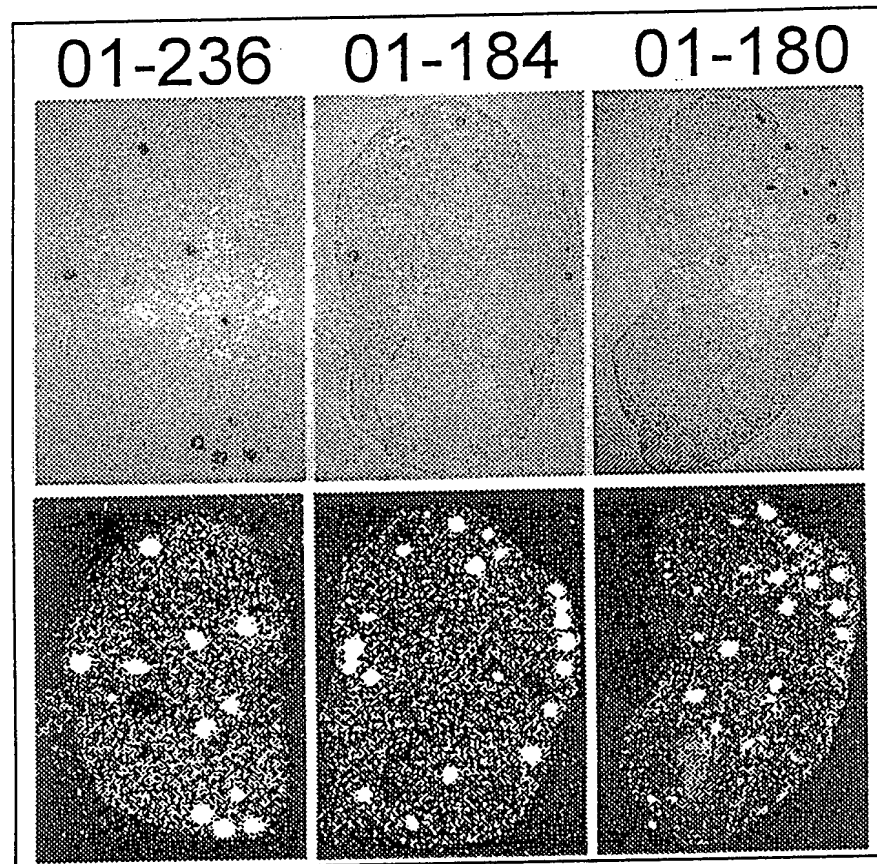


Figure 8



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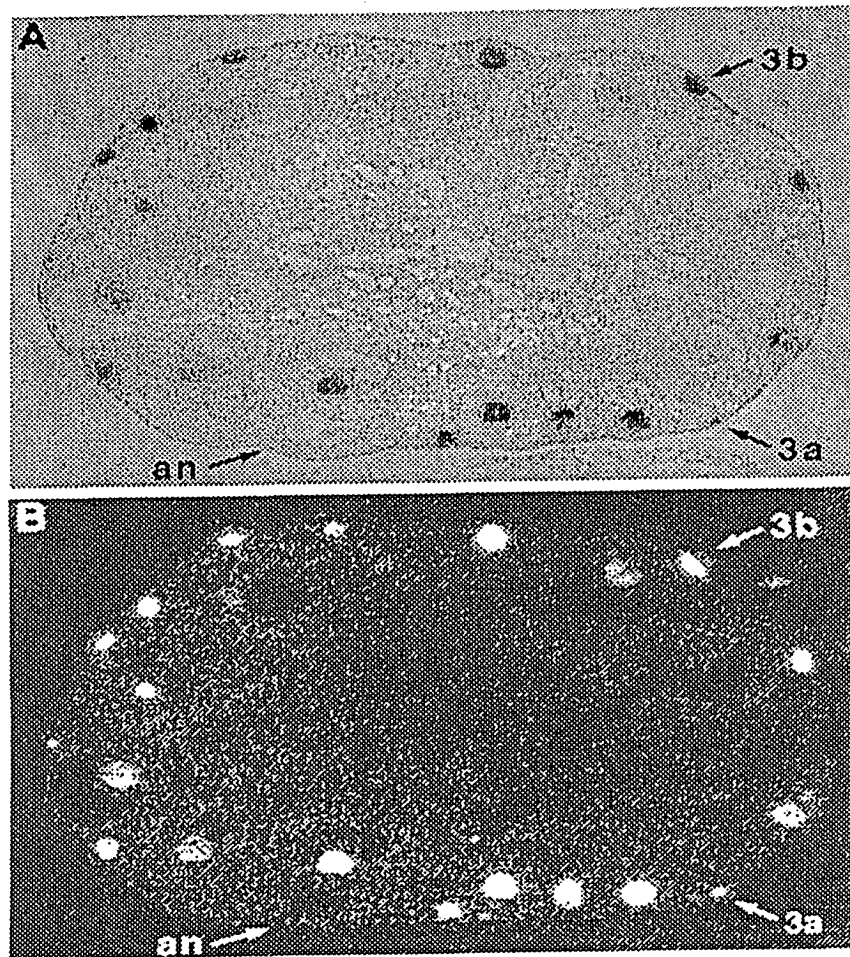


Figure 9

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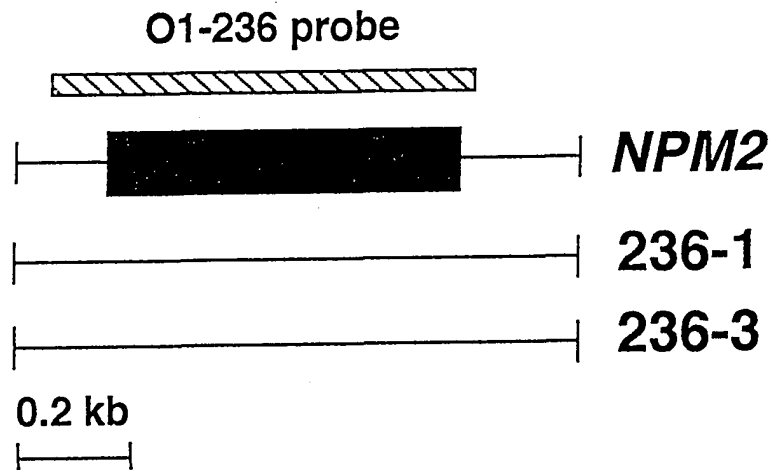


Figure 10

**Npm2** MSRHSTSSVTETAK--NMLWGSELN-QEKQTCTFRGQG-EKKDCKLLL  
|. ||| | . . . |||||. |. |. |. |.  
**Xnpm2** MA--STVSNTSKLEKPVSLIWGCELNEQDK-TFEFKVEDDEEKCEHQAL

[illegible]

PKC
CK2

96 PPVTFRLRTGSGPVFLSGLECYETSDLTWEDDEEEEEEEEEEEDEDEDADI  
 |||||...|||...| . | . . . . . | . . . . . | . . . . . |

98 PPVTFRLKAGSGPLYISGOHVAMEEDYSWAEEDEGEAEGEEEEEEEED-  
 |||||...|||...| . | . . . . . | . . . . . | . . . . . |

CK2

146 SLEEIPVKQVKRVAPQKQMSIAKKKKVEKEEDET TVVRPSSPQDKSPWKKEK  
          . | | | | | | | | | . . | | | | | . | | | | |  
147 --OESP PKAVKRPAA TKKAGOAKKKKLDKE-DE-----SSEEDSPTKKGK

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196 STPRAKKPVTKK 207
    .. |..|||..||
189 GAGRGRKPAACK 200

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Figure 11

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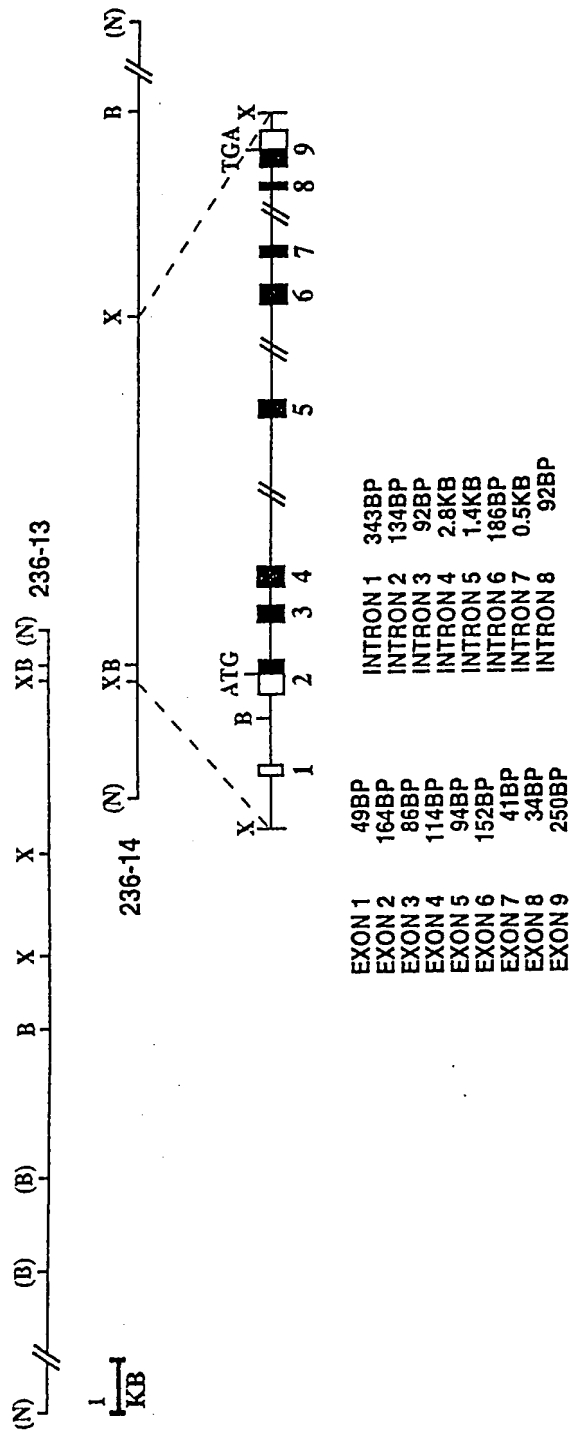


Figure 12

Mouse *Npm2* Gene Sequences

acagcagaggtgatgctcagaaatcaagttttaacagagggccaggtg  
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 ccaggcttcttaacagcctgctgtgggaagctgacccttagatggagc  
 cctgaaGCCATATTGAGGACCTGCAGTAGAGGTGGAACCCATGACTGG  
 CAGCGCAgtaagcttgagcagg... intron 1 = 343bp  
 ...ctttgcattactcagAACACAGTGATAACAGCTGAGCTCCAAGCA  
 AGGACCCAGGACCTTGCCTCACCACAGACATAATCTTTCCCCACAACA  
 CCTCCACCAAGCCGCCCTGTAAATCGAC ATG AGT CGC CAC AGC  
 1 M S R H S  
  
 ACC AGC AGC GTG ACC GAA ACC ACA GCA AAA AAC ATG  
 6 T S S V T E T T A K N M  
  
 CTC TGG Ggtaagggctaaggct... intron 2 = 134bp  
 18 L W  
  
 ...gtcttcgctgtgcagGT AGT GAA CTC AAT CAG GAA AAG  
 20 G S E L N Q E K  
  
 CAG ACT TGC ACC TTT AGA GGC CAA TGC GAG AAG AAG  
 28 Q T C T F R G Q C E K K  
  
 GAC AGC TGT AAA CTC TTG CTC AGC ACGgtgggtgtctccc  
 40 D S C K L L L S T  
  
 aa... intron 3 = 92bp ...catcacctttctcagATC  
 49 I  
  
 TGC CTG GGG GAG AAA GCC AAA GAG GAG GTG AAC CGT  
 50 C L G E K A K E E V N R  
  
 GTG GAA GTC CTC TCC CAG GAA GGC AGA AAA CCA CCA  
 62 V E V L S Q E G R K P P  
  
 ATC ACT ATT GCT ACG CTG AAG GCA TCA GTC CTG CCC  
 74 I T I A T L K A S V L P  
  
 ATGgtgagtcttctctcc... intron 4 = 2.8kb ...agaa  
 86 M  
  
 gggggacacagGTC ACT GTG TCA GGT ATA GAG CTT TCT  
 87 V T V S G I E L S  
  
 CCT CCA GTA ACT TTT CGG CTC AGG ACT GGC TCA GGA  
 96 P P V T F R L R T G S G

Figure 13A

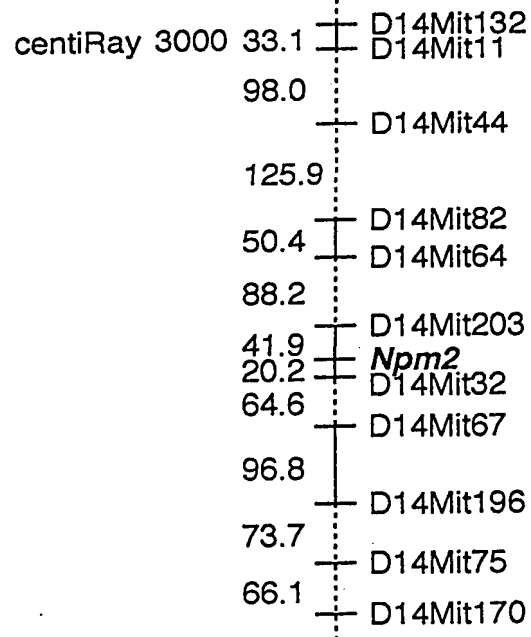
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108 CCT GTG TTC CTC AGT GGC CTG GAA TGT TAT Ggtaagtt  
 P V F L S G L E C Y  
 gtagccta... intron 5 = 1.35kb ...ggctacccattcc  
 118 agAG ACT TCG GAC CTG ACC TGG GAA GAT GAC GAG GAA  
 E T S D L T W E D D E E  
 130 GAG GAG GAA GAG GAG GAG GAA GAG GAT GAA GAT GAG  
 E E E E E E E E D E D E  
 142 GAT GCA GAT ATA TCG CTA GAG GAG ATA CCT GTC AAA  
 D A D I S L E E I P V K  
 154 CAA GTC AAA AGG GTG GCT CCC CAG AAG CAG ATG AGC  
 Q V K R V A P Q K Q M S  
 166 ATA GCA AAGgtggggggaaaagaa... intron 6 = 186bp  
 I A K  
 169 ...tggtttttgtccagAAA AAG AAG GTG GAA AAA GAA  
 K K K V E K E  
 176 GAG GAT GAA ACA GTA GTG AGgtaattcatgcagtt...  
 E D E T V V R  
 183 intron 7 = 0.5kb ... ctattccctttccagG CCC AGC  
 P S  
 185 CCT CAG GAC AAG AGT CCC TGG AAG AAG gtgagcaataag  
 P Q D K S P W K K  
 194 aag... intron 8 = 92bp ...ctcttatctgcacagGAG  
 E  
 195 AAA TCT ACA CCC AGA GCA AAG AAG CCA GTG ACC AAG  
 K S T P R A K K P V T K  
 207 AAA TGA CCTCATCTTAGCATCTTCTGCGTCCAAGGCAGGATGTCCA  
 K \*  
 GCAGCTGTGTTCTGGTGCAGGTGTCCAGCCCCACCACCCTAGTCTGAA  
 TGTAATAAGGTGGTGTGGCTGTAACCCTGTAACCCAGCCCTCCAGTTT  
 CCGGAGGTTTTTGGTGAAGAGCCCCCAGCAAGTTCGCCTAGGGCCACA  
 ATAAAATTTCATGATCAGGacctccctctgctcccccctccctggat  
 gggctctcctcgctgctgcatagctcatgtgccagcagaggggaacc  
 acgagcaagaaaccagccccatgt

Figure 13B

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## T31 RH Chr 14



## Haplotypes for T31 Chr 14 near Npm2

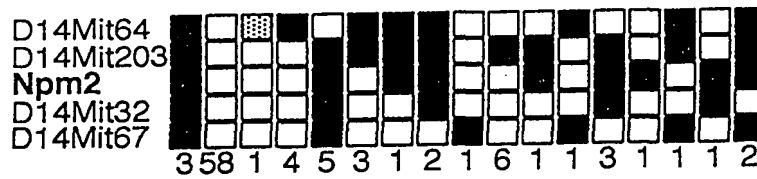


Figure 14